

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/DE2004/001447

International filing date (day/month/year)
07.07.2004

Priority date (day/month/year)
28.07.2003

International Patent Classification (IPC) or both national classification and IPC
F04B43/04, F04B19/00

Applicant
ROBERT BOSCH GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/DE2004/001447

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/DE2004/001447

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11,13-15
	No: Claims	12
Inventive step (IS)	Yes: Claims	1-11,13-15
	No: Claims	12
Industrial applicability (IA)	Yes: Claims	1-15
	No: Claims	

2. Citations and explanations

see separate sheet

Zu Punkt V

- V.1 Die vorliegende internationale Anmeldung erfüllt nicht die Erfordernisse des PCT, da der Gegenstand des unabhängigen Anspruchs 12 nicht neu i.S.d. Artikel 33(2) PCT ist.

Das Dokument US 5,096,388 A, das als nächstkommender Stand der Technik angesehen wird, offenbart

- eine Mikropumpe mit mindestens einer Pumpkammer (60,136,138) (Figs. 1,3,5,6);
- die Pumpkammer ist von einer Deckplatte 130 und einer Membran (142,160) begrenzt (Figs. 5,6);
- die Pumpmembran (142,160) ist auf einer Grundplatte (140,178) gehalten (Figs. 5,6);
- ein Fluid ist über Einlass (132) ansaugbar und über einen Auslass (134) aussaugbar (Figs. 5,6);
- die Pumpmembran ist aus einer Polysiliciumschicht gebildet (polysilicon, Anspruch 14).

Da somit sämtliche technische Merkmale des unabhängigen Anspruchs 12 in dem Dokument US 5,096,388 A offenbart sind, ist dessen Gegenstand nicht neu (Artikel 33(2) PCT).

- V.2 Der Gegenstand des unabhängigen Anspruchs 1 scheint die Erfordernisse des PCT in Bezug auf Neuheit und erfinderischer Tätigkeit zu erfüllen, da aus dem im Recherchenbericht genannten Stand der Technik kein Verfahren zum Herstellen eines mikromechanischen Bauteils unmittelbar oder mittelbar hervorzugehen scheint, wonach mit Hilfe einer ersten und einer zweiten Stoppschicht (z.B. SiO_2) eine jeweilige erste und zweite Funktionsschicht (z.B. Polysilicium) aufgebracht werden, wobei diese Funktionsschichten nach Aufbringen einer Ätzmaske (z.B. Photolack) strukturiert werden.

Aus dem Dokument US 5,096,388 A oder aus dem in der Beschreibung genannten Dokument US 6,390,791 A scheinen lediglich Fachübliche Ätzverfahren entnehmbar zu sein, welche die Funktionsbereiche einer Mikropumpe strukturieren, ohne einen Einsatz

von Stopschichten aus SiO₂ vorzusehen.

- v.3 Die abhängigen Ansprüche 2 bis 11 sind auf den Anspruch 1 rückbezogen und erfüllen daher ebenfalls die Erfordernisse des PCT in Bezug auf Neuheit und erfinderischer Tätigkeit.

Die in den abhängigen Ansprüchen 13 bis 15 jeweils definierte Merkmalskombinationen scheint aus dem Dokument US 5,096,388 A , oder aus irgend einem der im Recherchenbericht genannten Dokumente nicht bekannt zu sein, und scheint durch keines dieser Dokumente alleine oder in Kombination nahegelegt zu sein.